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International Universities Strength
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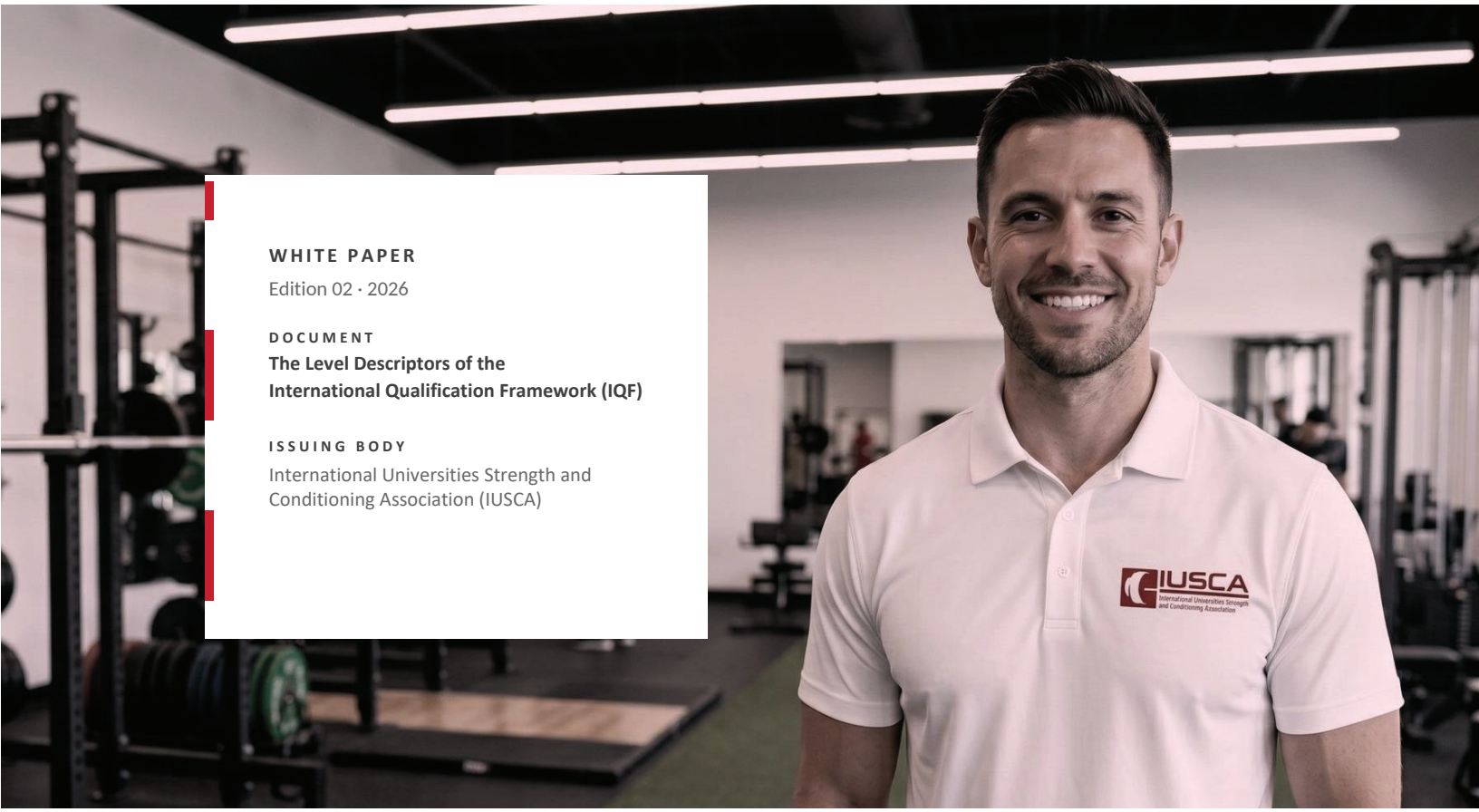
IN COLLABORATION WITH
International Qualification Framework
Independent Regulatory Council (IQF-IRC)

Redefining Competence in Strength and Conditioning

The Level Descriptors of the International Qualification Framework (IQF)



WHITE PAPER

Edition 02 · 2026

DOCUMENT

The Level Descriptors of the International Qualification Framework (IQF)

ISSUING BODY

International Universities Strength and Conditioning Association (IUSCA)

Executive Summary

This document presents the IQF Level Descriptors for the strength and conditioning (S&C) profession. Developed by the International Universities Strength and Conditioning Association (IUSCA) and supported by the International Qualification Framework Independent Regulatory Council (IQF-IRC), the framework provides a clearer, more practical, and more modern account of professional progression in S&C.

A central premise of this work is that a view of practice based primarily on the accumulation of facts, rule-based methods, and fixed approaches is no longer fit for purpose. In real-world environments, practitioners must operate under uncertainty, make context-specific decisions, and continually respond to feedback and error. The IQF Level Descriptors, therefore, define progression through increasing sophistication in reasoning, professional judgement, autonomy, and complexity management, rather than through content accumulation alone.

To make this progression clear, the framework outlines an eight-level developmental pathway. While the same broad scientific principles apply across all levels, the descriptors define the distinct reasoning and practical capabilities expected at different phases of a practitioner's development:

LEVELS 1–2 **Foundational and supervised practice**

Practitioners focus on carrying out structured, rule-based tasks under supervision, while learning to connect basic training stimuli to externally defined outcomes.

LEVELS 3–4 **Developing practice**

Practitioners begin to apply conditional reasoning, match stimuli more intentionally to intended adaptations, manage interacting variables, and take increasing independent responsibility for decisions within their scope of practice.

LEVELS 5–7 **Scientific and advanced practice**

Practitioners operate with increasing confidence under non-linear complexity, weigh evidence against decision risk, anticipate indirect consequences, and actively design error-correcting environments for themselves and others.

LEVEL 8 **Field-shaping practice**

Practitioners contribute to field-level decision-making and to the development of the profession itself through strategic leadership, governance, critical evaluation, and the shaping of standards, policy, and professional direction.

This framework marks a deliberate shift in how professional capability is understood. Expertise should not be inferred from authority, time served, or unexplained appeals to an "art" of coaching. The IQF instead seeks to make professional expertise more explicit and open to development, scrutiny, and improvement through explanatory problem-solving, critical thinking, and continual error correction.

Developed through a structured expert consultation process, these descriptors are intended to be credible, practical, and accessible. Rather than prescribing strict implementation rules, this document provides a shared foundation for future development across education, certification, employment, and professional recognition. The aim is to help universities, employers, certification bodies, and the wider sport and exercise science community raise standards, clarify roles, and support a more scientifically grounded future for the profession.

Edition 2 Revision Note

Edition 2 (2026) incorporates minor refinements made following further development of the IQF Level Descriptors and preparation of the subsequent IUSCA position statement. These include updated terminology and definitions, refinements to selected level descriptors, greater transparency regarding the expert consultation process, and clarification of the provisional, versioned status of the framework. The underlying eight-level structure and developmental logic remain unchanged. The current official version of the descriptors and revision history are maintained at https://www.iusca.org/iqf-level-descriptors.

Introduction

Founded in 2019, the International Universities Strength and Conditioning Association (IUSCA) is a not-for-profit, international accreditation body, working to advance strength and conditioning (S&C) education, research, and professional standards. Through collaboration with over 150 universities and institutions worldwide, the IUSCA works to strengthen the profession by promoting the principles and values of science and by supporting greater quality, consistency, and credibility across S&C practice.

In 2024, the International Qualification Framework (IQF) was introduced as a standardised and internationally relevant structure for aligning certifications, qualifications, and standards within the global S&C profession. It was developed in response to longstanding inconsistencies in how S&C education, certification, and professional capability are recognised across different contexts and countries. In 2025, this work was strengthened further through the establishment of the International Qualification Framework Independent Regulatory Council (IQF-IRC), providing independent oversight of the framework and supporting its longer-term governance and credibility.

This document builds on that foundation by defining the eight levels of the IQF more clearly through a set of explicit level descriptors. Its purpose is to provide a practical and accessible explanation of what progression in S&C looks like across levels of practice, and to support future application of the framework across education, certification, professional development, employment, and wider professional recognition. The document is intended for a broad audience, including universities, employers, practitioners, industry bodies, and stakeholders in related sport and exercise science domains.

Defining the Problem

A common assumption in S&C is that better practice comes from accumulating more facts, learning more fixed methods, and collecting more data. While these are all important, they are not enough on their own. In real-world coaching and applied practice, practitioners work in environments that are always shaped by specific individuals, constraints, goals, and contexts. Research findings are produced under particular conditions and cannot simply be transferred into new settings as fixed answers.

What practitioners need is not just information, but scientific explanations. They need to understand why particular outcomes occur, why certain interventions may work, and under what conditions those effects are likely to hold. Effective practice, therefore, depends on the ability to identify problems, interpret evidence using sound reasoning, and apply this in context.

A related problem is that aspects of higher-level judgement in S&C are often described as the "art of coaching" or as practitioner "wisdom". Such terms may serve as temporary descriptions of knowledge that has not yet been fully understood or articulated. However, they provide little explanatory value when treated as permanent categories that are beyond investigation. The challenge is therefore to identify how effective judgement can be developed, demonstrated, criticised, and improved, including where some components remain difficult to articulate.

This creates a challenge for the profession. If important aspects of practice remain vague or poorly defined, then education cannot teach them clearly, certification cannot assess them properly, and employers cannot reliably distinguish between different levels of competence. In practice, this weakens professional standards, limits progression, and makes it harder for the field to communicate its value with clarity.

The position taken in this paper is different. The IUSCA is a science-based organisation, but this means more than simply valuing scientific facts. It means valuing the principles and values of science: explanation, reasoning, criticism, openness to revision, and continual error correction. Knowledge in S&C will always remain incomplete, but that is not a reason to leave important questions unexplained. Rather, it is a reason to improve our explanations, refine our standards, and build a profession that is organised around continual learning and progress.

This is the problem the IQF Level Descriptors are intended to address. They provide a clearer framework for understanding progression in S&C practice, not simply in terms of content learned or methods followed, but in terms of the development of reasoning, judgement, and the capacity to act effectively under uncertainty.

How the Descriptors Were Developed

The IQF Level Descriptors were developed to provide a clearer account of what progression in S&C practice looks like. They build on the earlier development of the International Qualification Framework (IQF), which established a broader structure for aligning certifications, qualifications, and standards within the profession.

At the heart of this work is a simple view of practice: S&C is fundamentally a form of explanatory problem-solving directed at real physical systems. Practitioners attempt to bring about meaningful change and improve their decisions over time through observation, feedback, and continual error correction. On this basis, progression in practice is defined as improvement in the quality of explanation, reasoning, judgement, and intervention, rather than as the accumulation of fixed methods or information alone.

Figure 1. *Principles of strength and conditioning practice.*

These principles, as outlined in Figure 1, informed the development of the descriptors and provided the conceptual basis for the expert consultation process described below.

To define the levels more explicitly, the descriptors were developed through a two-stage expert consultation led by Alex Wolf on behalf of the IUSCA and the IQF-IRC. Contributors were identified as experienced practitioners, academics, and educators with substantial expertise across applied, academic, and professional contexts in S&C and related disciplines.

Contributors were not asked to validate the eight-level structure, which had been established in prior work, or to endorse the philosophical position of the IUSCA. The purpose of the consultation was to ground the descriptors in professional practice and to shape, refine, and pressure-test them rather than to generate empirical research findings or a formal consensus statement.

In the first stage, nineteen contributors were invited to provide written input on how practitioner expertise develops in real settings, with twelve completed responses received. Responses were reviewed to identify recurring developmental themes across reasoning, outcome definition, adaptation, evidence use, complexity management, autonomy, and error correction. These themes informed the structure and content of the draft descriptors.

In the second stage, the draft Level 1 to 8 descriptors and accompanying Overview Table were circulated to thirty contributors, including participants from the first stage and additional reviewers. Twelve responses were received. Feedback was incorporated through essential and recommended refinements that strengthened clarity while preserving the underlying logic of the framework.

The result is a set of descriptors intended to define how practitioners develop the capacity to reason, decide, and act under increasing complexity, extending beyond traditional ideas of progression based simply on tasks, methods, or time served. These descriptors represent the institutional position of the IUSCA, informed and pressure-tested through expert input. Acknowledgement as a contributor reflects participation in the consultation process and does not imply endorsement of the philosophical position, final wording, or institutional conclusions.

Developmental Logic of the Framework

The IQF Level Descriptors are designed to describe how the quality of practitioners' thinking and decision-making develops as the demands of practice grow more complex. They are not primarily intended to describe progression through fixed tasks, prescribed methods, an accumulation of facts, or years of experience.

In this framework, the same broad scientific principles apply at all levels. What changes across the levels is how well practitioners are able to define problems, interpret information, manage uncertainty, and make effective decisions in practice. The framework is therefore intentionally method-agnostic and focused on how practitioners think, interpret, and act in real-world environments.

At its broadest level, the framework describes a progression from externally guided, rule-following behaviour at the lower levels, through increasingly conditional and context-sensitive reasoning, towards scientific, system-level, and field-shaping judgement at the highest levels. This progression can be understood as a movement from rule-based practice, through principle-based practice, and ultimately towards explanatory problem-solving.

In the early stages, practitioners rely more heavily on rules, instructions, and established procedures. As they develop, they become more capable of questioning whether those methods fit the situation in front of them, adapting practice in context, and reasoning from mechanism and intent rather than from method alone. At the higher levels, practice becomes increasingly explanatory rather than procedural.

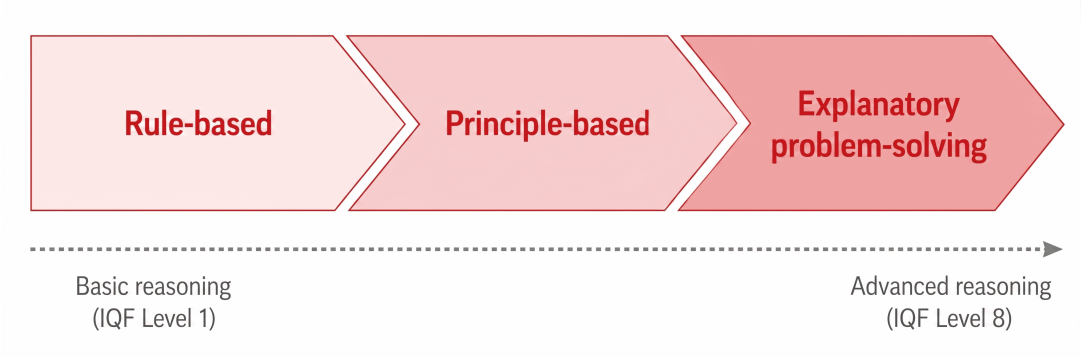


Figure 2. *Development of practitioner reasoning across the IQF.*

A second thread running across the framework concerns the practitioner's relationship with science and evidence. At the lower levels, science is more likely to be treated as a body of facts or as a source of authoritative guidance. As practitioners develop, science becomes less a source of prescription and more an interpretive tool. Higher-level practitioners are distinguished not by how much evidence they can cite, but by how effectively they can define problems, use evidence and relevant scientific principles to develop explanations, implement outcome-based methods, test assumptions, weigh uncertainty, and revise decisions under real-world constraints. In this sense, progression is about using knowledge more effectively, instead of simply about knowing more facts.

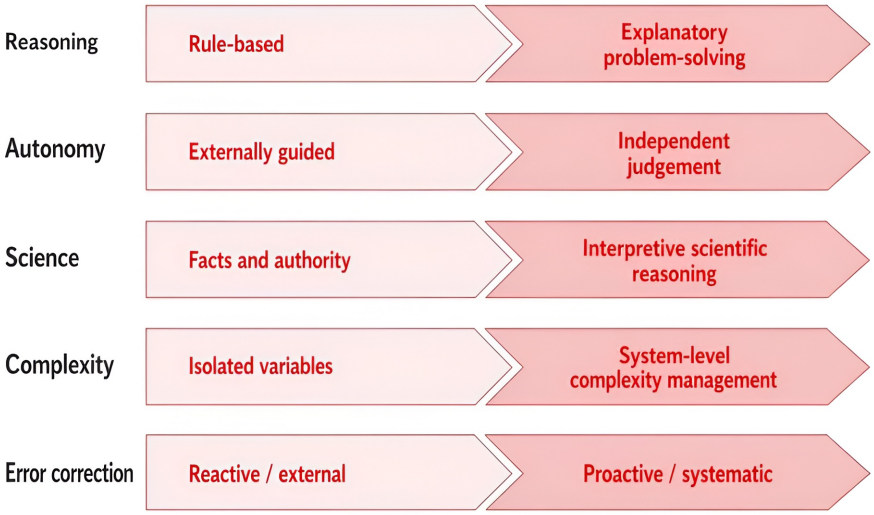


Figure 3. *Key dimensions of progression across the IQF.*

A third and especially important thread is error correction. Across the framework, progression is associated with increasing sophistication in how practitioners identify, interpret, and respond to error. At the lowest levels, errors are identified largely by others and reflection is limited. At intermediate levels, practitioners begin to recognise mismatches between intended and observed outcomes and to adjust

practice accordingly. At higher levels, practitioners build feedback loops into their decision-making, actively seek disconfirming information, and revise explanations without defensiveness. At the most advanced levels, this expands beyond the individual practitioner to the shaping of environments, cultures, and systems that support ongoing learning and error correction. In this way, expertise is defined by greater effectiveness in recognising and reducing all forms of error.

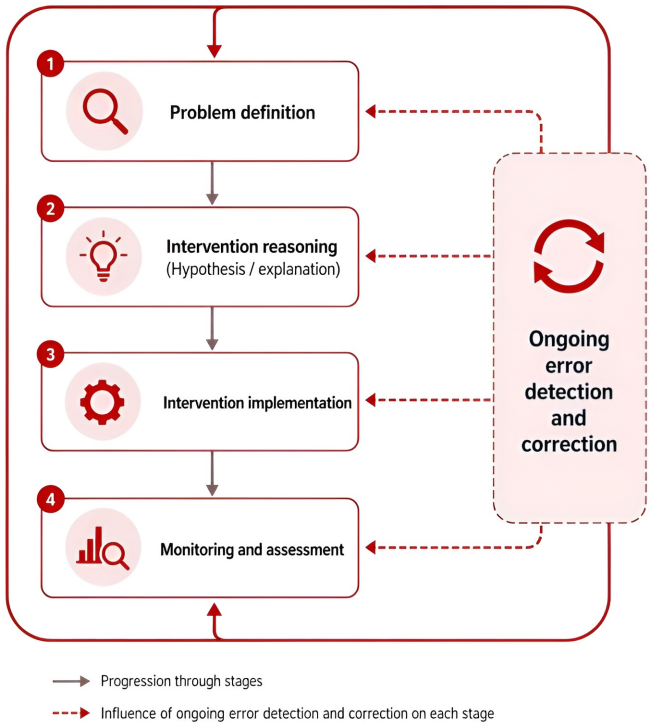


Figure 4. *The role of ongoing error detection and correction within the practice cycle.*

The following Overview Table should be read as the primary representation of this developmental logic. It is designed to show progression across the major dimensions of practice simultaneously, including reasoning orientation, outcome definition and intent, adaptation and stimulus reasoning, relationship to evidence and scientific reasoning, complexity and variable management, autonomy and responsibility, and error detection and correction. The full written descriptors that follow provide additional depth, but they are intended to be read alongside the table rather than as separate or independent criteria. Taken together, the framework presents practitioner progression as a progression in the quality of reasoning and judgement under uncertainty.

Status and Revision of the Descriptors

The IQF Level Descriptors represent the current institutional position of the IUSCA, informed and pressure-tested through expert consultation. They are provisional, criticisable, and open to revision. As better explanations, evidence, and professional insights emerge, the descriptors may be revised in versioned form. The current official version of the descriptors and a record of revisions are maintained at https://www.iusca.org/iqf-level-descriptors.

Contributors

The level descriptors were informed and refined through consultation with a range of experienced practitioners, academics, and educators across S&C and related domains. Contributors included:

Name	Role	
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Key Definitions

The following definitions clarify the meaning of several key terms used throughout this document.

SCIENCE

Science is a systematic way of understanding reality through conjecture, logical reasoning, empirical evidence, and criticism. It develops explanations that can be scrutinised and tested so that errors can be identified and corrected over time.

In applied practice, science is expressed as systematic problem-solving under uncertainty. Practitioners construct explanations, derive predictions, and use observation, measurement, feedback, and criticism to refine their understanding and actions.

SCIENTIFIC PRACTITIONER

A scientific practitioner is a professional who applies science as a systematic approach to problem-solving. They identify practical problems, develop explanatory hypotheses grounded in relevant scientific principles, use research evidence to constrain and refine those hypotheses, and treat interventions as testable predictions. Observation, measurement, reflection, and criticism are used to identify error and improve decisions over time.

Within the IQF, being scientific does not require the practitioner to be an academic researcher. It refers to the effective use of explanation, evidence, reasoning, and error correction in practice.

KNOWLEDGE

Knowledge is understood as information, understanding, or capability with explanatory or practical significance. It includes knowledge of concepts and principles, knowledge of how to apply them effectively, and operational capability that may be perceptual, cognitive, motor, biological, or socially distributed. Knowledge may therefore be propositional, procedural, or embodied in forms that are not yet fully represented in language.

Across the IQF, progression reflects increasing explanatory depth, practical capability, and effectiveness in action.

EXPLANATION

An explanation is an account of why something has happened, is happening, or is likely to happen, grounded in claims about relevant structure and causal processes. A good explanation is clear, coherent, criticisable, and consistent with relevant evidence. Its practical value lies in supporting better problem definition, prediction, intervention, implementation, and revision.

PROBLEM

A problem is a conflict between ideas, expectations, goals, constraints, or observed states of the world. Problems may concern immediate decisions in practice or wider questions that provide a basis for future inquiry, research, or professional development.

ERROR AND ERROR CORRECTION

An error is any discrepancy between our knowledge, decisions, or actions and the reality they are intended to represent or affect. Errors may occur in factual or mechanistic knowledge, problem definition, explanation, intervention design, coaching and communication, measurement, data handling, or interpretation of feedback.

Error correction refers to the processes through which such discrepancies are identified, interpreted, and reduced. Progression across the IQF is characterised by increasing sophistication in detecting error earlier, locating it more accurately, and correcting it more effectively.

OVERVIEW TABLE

IQF Level 1–8 Descriptor Overview

The table below presents the eight IQF levels mapped against seven dimensions of professional practice. It should be read as the primary representation of the developmental logic of the framework, with the full written descriptors that follow providing additional depth.

Level	Title	Reasoning Orientation	Outcome Definition & Intent	Adaptation & Stimulus Reasoning	Relationship to Evidence & Scientific Reasoning	Complexity & Variable Management	Autonomy & Responsibility	Error Detection & Correction
1	**Foundational Learner**	Rule-following; reasoning largely external. Begins to recognise simple cause–effect relationships in isolation.	Outcomes defined by others; practitioner follows direction rather than setting purpose. Intent is externally supplied and largely unquestioned.	Understands that training creates change but not how or why. Adaptation assumed rather than evaluated.	Science treated as facts to be learned. No interpretation.	Focuses on isolated, immediate variables. Assumes direct and linear cause–effect relationships.	Operates under direct supervision. No independent decision-making responsibility.	Errors identified externally. Limited self-reflection.
2	**Supervised Practitioner**	Applies rules with basic understanding. Begins asking “why” when prompted.	Can name intended outcomes when prompted; defaults to method-led decisions under pressure, prioritising familiar procedure over outcome alignment.	Recognises different stimuli produce different effects. Limited sensitivity to dose.	Applies simple scientific explanations. Science treated as authoritative.	Manages a small number of immediate variables in a structured setting.	Makes decisions within structured tasks under supervision. Limited responsibility for outcomes.	Responds to feedback. Rarely anticipates issues.
3	**Developing Practitioner**	Conditional reasoning begins. Adapts rules to context, but rationale may be fragile under uncertainty.	Outcomes clearer but inconsistently prioritised. Methods sometimes selected before intent.	Adjusts load and structure reactively. Over-responds to short-term signals.	Begins interpreting evidence. Correlation vs causation inconsistently distinguished.	Manages several interacting factors; beginning to recognise trade-offs.	Makes independent decisions within a clearly defined role boundary; refers beyond that boundary to a supervisor or senior practitioner.	Reflects after failure. Limited proactive monitoring.
4	**Practitioner**	Uses principles to adapt practice. Can clearly explain rationale for decisions.	Outcomes explicit and appropriately defined. Competing outcomes acknowledged.	Matches stimulus to intent deliberately. Balances stress and recovery intentionally.	Evidence interpreted contextually. Understands limitations and uncertainty.	Manages several interacting factors across defined scope; prioritisation becoming consistent.	Makes independent decisions within role scope. Accountable for outcomes within that scope.	Builds feedback into practice. Adjusts without defensiveness.

Level	Title	Reasoning Orientation	Outcome Definition & Intent	Adaptation & Stimulus Reasoning	Relationship to Evidence & Scientific Reasoning	Complexity & Variable Management	Autonomy & Responsibility	Error Detection & Correction
5	**Developing Scientific Practitioner**	Integrates multiple principles simultaneously. Reasoning resilient under pressure.	Outcomes framed conditionally. Trade-offs managed explicitly.	Anticipates delayed and indirect effects. Strategic restraint used.	Weighs evidence strength against decision risk. Avoids over-interpretation.	Manages multiple competing and non-linear demands; anticipates indirect consequences.	Leads a defined practice area with autonomy; begins to shape the reasoning environment and decision-making conditions for junior practitioners within it.	Proactively tests assumptions. Adjusts before failure escalates.
6	**Scientific Practitioner**	Robust, transferable reasoning across contexts. Consistent decision quality.	Manages systems of outcomes. Balances short- and long-term effects.	Manipulates stimulus strategically. Avoids unnecessary intervention.	Integrates multiple evidence sources. Acts effectively with incomplete information.	Manages extensive system-level complexity; anticipates second-order effects.	Full professional accountability for outcomes. Leads multi-practitioner systems, including staff, processes, and athlete cohorts.	Designs environments for learning. Models belief revision publicly.
7	**Advanced Scientific Practitioner**	Pattern recognition and anticipatory judgement. Recognises interactions and indirect effects across disciplines.	Shapes environments to support outcomes. Accepts irreducible trade-offs.	Manages adaptation at organisational scale. Chooses when not to act.	Critiques models and assumptions. Uses science to explain, not justify.	Manages organisational complexity across disciplines; second-order awareness throughout.	Holds strategic responsibility for decision-making across teams. Accountable for others' decision quality.	Establishes error-correcting cultures. Prevents dogma formation.
8	**Field-Shaping Practitioner**	Meta-reasoning about reasoning. Challenges underlying assumptions of the field.	Frames outcomes at policy and paradigm level. Balances competing values and impacts.	Influences systems shaping adaptation beyond individual programmes.	Develops, refines, or challenges explanatory frameworks. Advances understanding.	Manages extreme, evolving system-level complexity. Recognises that some uncertainty may remain practically irreducible while continuing to treat explanations, assumptions, and models as open to improvement.	Shapes standards, policy, and governance. Accountable for field-level consequences.	Safeguards scientific integrity. Ensures mechanisms for ongoing revision.

Full Level Descriptors

The full descriptors below provide additional depth on each level. They are intended to be read alongside the Overview Table rather than as separate or independent criteria.

LEVEL 1 Foundational Learner

At Level 1, the practitioner operates within a highly structured and supervised environment and follows instructions and established procedures without yet recognising them as choices among possible methods. Behaviour is compliance-driven rather than reasoning-led, with decisions guided externally and explanations provided by others.

The practitioner recognises simple cause-and-effect relationships but does not yet reliably connect actions to outcomes without guidance. Intended outcomes are broad, implicit, or defined by supervisors, and the practitioner relies on direction to understand purpose and intent.

Training and practice are understood to create change, but adaptation is assumed rather than evaluated. The practitioner follows prescribed instructions without independently adjusting stimulus, dose, or structure.

Scientific knowledge is treated primarily as factual information to be learned and recalled, with no expectation of independent interpretation or critique. Complexity is experienced as linear, with attention typically limited to a single variable at a time.

Autonomy is minimal. The practitioner acts under direct supervision and does not hold responsibility for decision outcomes. Errors are identified and corrected externally, with limited reflective capability.

LEVEL 2 Supervised Practitioner

At Level 2, the practitioner applies simple rules and procedures to routine situations with increasing familiarity and demonstrates emerging awareness of underlying principles. Reasoning remains constrained but is no longer entirely passive. The practitioner begins to recognise that methods are choices rather than fixed rules, although they may revert to method-led behaviour under pressure or in unfamiliar contexts. This reversion is characteristic of the stage rather than a failure of competence.

The practitioner can articulate simple outcomes when guided, although decision-making may default to familiar methods rather than intent under pressure. There is increasing recognition that different stimuli produce different effects, but sensitivity to dose and context remains limited.

Scientific information and established principles are applied through straightforward explanations and are generally treated as authoritative rather than interpretive. The practitioner manages a small number of variables but experiences difficulty prioritising when multiple factors are present.

Autonomy remains limited, with decisions subject to supervision and approval. The practitioner responds appropriately to feedback but does not routinely anticipate errors or unintended consequences without prompting.

LEVEL 3 Developing Practitioner

At Level 3, the practitioner demonstrates conditional reasoning and adapts established rules to context, although reasoning remains inconsistent under uncertainty. Temporary regression under pressure is characteristic of this stage and reflects the normal demands of developing independent judgement rather than a deficit in the practitioner. Decision-making shows increasing independence but lacks robustness.

Outcomes are articulated with greater clarity, although prioritisation remains variable and methods may still be selected before intent is fully resolved. Adaptation is managed reactively, with adjustments commonly driven by short-term signals rather than longer-term considerations.

The practitioner begins to interpret scientific evidence but does not consistently distinguish correlation from causation. Complexity is experienced through the interaction of multiple variables, and trade-offs are recognised but not yet managed reliably.

Autonomy is partial and bounded by role scope. The practitioner takes responsibility for assigned work within that scope and adapts their approach when solving problems. Reflection typically occurs after errors rather than through proactive monitoring or anticipation.

LEVEL 4 Practitioner

At Level 4, the practitioner demonstrates defensible judgement grounded in relevant principles. Decisions are explicitly justified: the practitioner can state why a course of action was chosen in relation to the intended outcome and accepts accountability for that choice within a defined scope. Reasoning is deliberate and articulable, although delayed or indirect effects are not yet anticipated consistently.

Outcomes are explicitly defined at an appropriate level of resolution, with competing objectives acknowledged and managed. The practitioner deliberately matches stimulus, dose, and structure to intended adaptation and balances stress and recovery with intent.

Scientific evidence is interpreted contextually, with recognition of its limitations and uncertainty. Evidence informs decisions rather than directing them automatically.

The practitioner manages multiple interacting variables and demonstrates effective prioritisation. Autonomy is established within role scope, with clear accountability for decisions and outcomes. Where applicable, the practitioner supervises routine activities of others and contributes to evaluation and improvement within their area of practice.

Errors are identified through embedded feedback processes, and adjustments are made without defensiveness or reliance on external correction.

LEVEL 5 Developing Scientific Practitioner

At Level 5, the practitioner integrates multiple principles simultaneously and demonstrates reasoning that remains robust under pressure. Decision-making reflects conditional logic and explicit management of trade-offs. The practitioner moves beyond justifying individual decisions to anticipating delayed and indirect consequences. Reasoning is provisional and conditional, acknowledging what cannot yet be known.

Outcomes are framed provisionally and adjusted as conditions evolve. The practitioner anticipates delayed and indirect effects and demonstrates deliberate restraint, including choosing not to intervene where the risks or costs outweigh the expected benefit.

Scientific evidence is weighed according to relevance, quality, uncertainty, and decision risk. The practitioner avoids over-interpretation and recognises when available evidence is insufficient to warrant action.

Complexity is managed through prioritisation rather than simplification, with an expectation of non-linear responses. The practitioner leads a defined practice area and reviews and develops their own and others' performance and decision quality.

Assumptions are tested actively, and error correction is applied proactively before problems escalate, with reduced reliance on external intervention.

LEVEL 6 Scientific Practitioner

At Level 6, the practitioner demonstrates consistently high-quality judgement across complex and unpredictable contexts. Reasoning is transferable, resilient, and explicit. Evidence and relevant scientific principles are used to generate explanations, test assumptions, and correct error under uncertainty. The practitioner also shapes the reasoning conditions for less experienced colleagues by designing structured learning opportunities, surfacing assumptions, and modelling deliberate decision-making.

Outcomes are managed as interconnected systems rather than isolated targets, balancing short- and long-term effects. Intervention is strategic, and unnecessary action is avoided.

Scientific evidence from multiple sources is integrated with explicit attention to uncertainty, causal relevance, and decision risk. Probabilistic models are used where appropriate without being treated as substitutes for explanation. The practitioner acts effectively with incomplete information and revises decisions as new evidence emerges.

Complexity is characterised by anticipation of second-order effects and indirect consequences. The practitioner holds full professional responsibility and leads multi-practitioner systems, teams, or performance environments.

Learning environments are intentionally designed to support reflection, criticism, and belief revision, both personally and across others.

LEVEL 7 Advanced Scientific Practitioner

At Level 7, the practitioner operates increasingly through pattern recognition and anticipatory judgement, including at the interfaces between disciplines. Reasoning reflects deep understanding of system behaviour and interaction. Expert judgement, however rapid or experience-based, remains explainable and open to scrutiny.

Outcomes are shaped by influencing environments, structures, and processes rather than through isolated interventions. Trade-offs are accepted as unavoidable features of complex systems and are managed transparently.

Adaptation is managed at organisational scale, with deliberate judgement applied to when intervention is and is not warranted. Scientific models and assumptions are critically evaluated and used to explain decisions rather than to provide post hoc justification.

The practitioner manages extensive complexity through system-level prioritisation and holds strategic responsibility for the quality of decision-making across teams. Responsibility includes contributing to professional knowledge and practice within the field.

The practitioner establishes error-correcting cultures in which near-misses are surfaced, decisions are reviewed without blame, and challenges to dominant professional narratives are judged according to standards of rigour, transparency, and evidence. Dogmatic practices are actively challenged.

LEVEL 8 Field-Shaping Practitioner

At Level 8, the practitioner demonstrates meta-reasoning about professional practice and contributes to shaping how the field understands quality, judgement, and evidence. They influence field-wide developmental structures, including training pathways, mentoring frameworks, professional standards, policy, and governance. This level represents a shift from operating within existing systems to shaping how those systems are defined. It is a qualitatively different mode of practice rather than a simple extension of Level 7.

Outcomes are framed at policy, governance, or paradigm level, with competing values, impacts, risks, and long-term consequences considered. Influence extends beyond individual organisations to the profession as a whole.

The practitioner extends and, where necessary, redefines professional practice and its underpinning explanatory frameworks. Field-shaping authority does not exempt the practitioner from standards of rigour. Paradigm-level challenges must be transparent in reasoning, accountable in process, and open to peer scrutiny.

The practitioner recognises that some uncertainty may remain practically irreducible while continuing to treat explanations, assumptions, and models as open to improvement.

Responsibility includes stewardship of professional standards and scientific integrity. Structures for ongoing criticism, error correction, learning, and revision are established to support the continued credibility and development of the profession.

Implications for the Profession

The IQF Level Descriptors have value beyond defining stages of practitioner development. Their wider contribution lies in helping the profession describe progression more clearly, communicate standards more effectively, and provide a stronger foundation for future development across education, certification, employment, and professional practice.

At this stage, the framework does not attempt to prescribe how these areas should be designed or implemented. Rather, it identifies a number of important domains in which the descriptors may have significant implications and where future work and development are likely to be valuable.

For education

The framework provides a clearer basis for designing educational pathways that develop practitioners progressively, rather than simply exposing them to more content. It supports a shift from teaching fixed methods in isolation towards developing reasoning, judgement, and the ability to apply knowledge effectively in different contexts. This may help guide future development of educational pathways that are better aligned with genuine practitioner progression.

For certification

The descriptors help clarify what may need to be assessed at different levels of practice. At lower levels, assessment may focus more on foundational knowledge, safe practice, and structured application. At higher levels, assessment should increasingly reflect the ability to explain, decide, adapt, and refine practice under real-world conditions. This creates a stronger foundation for future work on certification models that are more meaningfully aligned with professional competence.

For employers

The framework offers a clearer way of distinguishing between different levels of practitioner capability. This may help employers make better decisions about role expectations, recruitment, progression, and remuneration. It also provides a stronger basis for future work on understanding what different levels of certification and experience should represent in practice.

For universities and education providers

The descriptors support universities and other providers in developing pathways that are aligned with professional progression without being reduced to narrow, prescriptive models of practice. They offer a structure that can support both employability and the broader educational aims of developing independent, scientifically grounded practitioners. This may be especially important as future work considers how the framework can be translated into diverse educational settings.

For research and knowledge development

The framework reinforces the importance of explanation, open inquiry, and error correction within the profession. In doing so, it supports stronger links between research and practice, encourages clearer reasoning about mechanisms and outcomes, and helps create conditions for cumulative knowledge growth across the field. These are likely to be important areas for continued development as the framework evolves.

For the profession as a whole

At the broadest level, the descriptors provide a shared structure for understanding progression in S&C. This has the potential to strengthen professional identity, improve coherence across education and certification, and support greater portability and recognition internationally. The framework is therefore intended not only to support individual practitioner development, but also to contribute to the longer-term maturation and professionalisation of the field.

Taken together, these descriptors matter because they make progression in S&C more explicit. They provide a clearer account of practitioner quality than models based mainly on methods learned, courses completed, or time served, by emphasising increasing sophistication in reasoning, judgement, and error correction. The implications outlined here should therefore be understood not as fully defined end points, but as important directions for future development and application.

Conclusion

This document has presented the IQF Level Descriptors as a clearer framework for understanding progression in S&C practice. At its core, the framework places reasoning, judgement, autonomy, and the ability to act effectively under uncertainty at the centre of practitioner progression, in place of definitions based primarily on methods, tasks, or time served.

The descriptors are intended to provide a foundation for future development across education, certification, employment, and professional recognition. While their wider application will continue to evolve, they offer a clearer shared structure for understanding practitioner progression and for supporting the continued development of the profession nationally and internationally.

Consistent with the principles underlying the framework, the IQF Level Descriptors should themselves remain open to criticism and improvement. Subsequent refinements will therefore be published transparently in versioned form, with the current official descriptors and revision history maintained online at https://www.iusca.org/iqf-level-descriptors.

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